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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,723	11/12/2003	Ian Robinson	NG(ST)-6757	7261
26294	7590	04/07/2004	EXAMINER	
TAROLLI, SUNDHEIM, COVELL & TUMMINO L.L.P. 526 SUPERIOR AVENUE, SUITE 1111 CLEVEVLAND, OH 44114			LAUTURE, JOSEPH J	
			ART UNIT	PAPER NUMBER
			2819	

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/706,723

Applicant(s)

ROBINSON, IAN

Examiner

Joseph Lauture

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-21 is/are allowed.
- 6) ☒ Claim(s) 1, 4-14 and 22-28 is/are rejected.
- 7) ☒ Claim(s) 2, 3 and 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### *Specification*

The application has not been checked to the extent necessary to determine the presence of all possible typographical and grammatical errors. Applicant's cooperation is requested in correcting any errors of which he/she may become aware in the application.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,4,13,14 and 22 are rejected as being anticipated by Zarubinsky et al (US 6,028,544).

Zarubinsky et al teach in figures 3-4 a digital-to-analog converter apparatus and method (See column 3, lines 32-42) that includes: a multi-stage delta-sigma modulator (208) that processes a digital input signal to produce a digital output signal having relatively high dynamic range adjacent frequency bands; a digital-to-analog converter (200) that converts the digital output signal into an analog output signal having a relatively high dynamic range frequency band; an analog filter assembly (See column 2, lines 51-53) that filters the analog signal, the analog filter having a given pass band; and, a comb filter (209) comprising adder (290) and a plurality of delay units (270), that

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provides a plurality of attenuating nulls and attenuates noise at the boundaries between the bands of the filter assembly output signal thereby improving signal to noise ratio.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-12 and 23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarubinsky et al (US 6,028,544) in view of Abbey (US 6,587,060) and Linder (US 6,693,573).

Regarding claims 5 and 25, Zarubinsky et al teach the essential features of the claimed invention as set forth above except for a circuit that predistorts the digital input signal. However, Abbey teaches a delta-sigma modulator comprising a circuit that predistorts a digital input signal to further linearize a digital-to-analog converter output. It would have been obvious to incorporate this well-known scheme of Abbey into the converter of Zarubinsky et al to improve system performance and reliability because this would improve linearity while providing high spurious free dynamic range (See column 1, lines 45-48).

Regarding claims 6-12 and 26-28, Zarubinsky et al teach the essential features of the claimed invention as set forth above, except for a frequency control circuit that controls the analog filter, the comb filter, the modulator or the digital-to-analog converter to alter frequency characteristics of the converter apparatus. However, Linder teaches

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a sigma-delta modulator that includes a digital adaptive control system that adjusts the frequency of the modulator (See column 9, lines 65-66), the delay of the comb filter and the clock to alter center frequencies of dynamic range regions and the frequency band of interest. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Zarubinsky et al and Linder to achieve a more reliable system because that would provide dynamic adjustment of characteristics in the system (See column 2, lines 23-26). It would have been further obvious to make use of a SAW filter based on the application.

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Allowable Subject Matter

Claims 2,3 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 15-21 are allowed.

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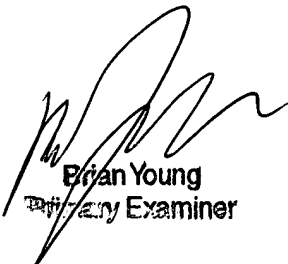
### CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Lauture, whose telephone number is (571) 272-1805. The examiner can normally be reached Monday thru Friday between 9:30 am and 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Tokar can be reached at (571) 272-1812. The fax number for the organization to which this application is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is (571) 272-1562.

Joseph Lauture  
Group: 2819  
Date: 04/01/2004



Brian Young  
Primary Examiner